# SCIENCE

## FOR LANGUAGE DEVELOPMENT

GRADE 7 • BOOK 1

BASED ON
ALASKA
SCIENCE
STANDARDS

Sealaska Heritage Institute

# *Integrating culturally responsive place-based content with language skills development for curriculum enrichment*


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The contents of this program were developed by Sealaska Heritage Institute through the support of a $1,690,100 federal grant from the Alaska Native Education Program.

2012

# Contents

# *Introduction to the Developmental Language Process in Science*

**OVER THE YEARS**, much has been written about the successes and failures of students in schools. There is no end to the solutions offered, particularly for those students who are struggling with academics. For example, there have been efforts to bring local cultures into the classroom, thus providing the students with familiar points of departure for learning.

While the inclusion of Native concepts, values,and traditions into a curriculum provide a valuable foundation for self-identity and cultural pride, they may not, on their own, fully address improved academic achievement.

Through science lessons, students are exposed to new information and to the key vocabulary that represents that information. While the students may acquire, through various processes, the scientific information, the vocabulary is often left at an exposure level and not internalized by the students. Over time, this leads to language delay that impacts negatively on a student's ongoing achievement.

Due to weak language bases, many Native Alaskan high school students struggle with texts that are beyond their comprehension levels and writing assignments that call for language they do not have.

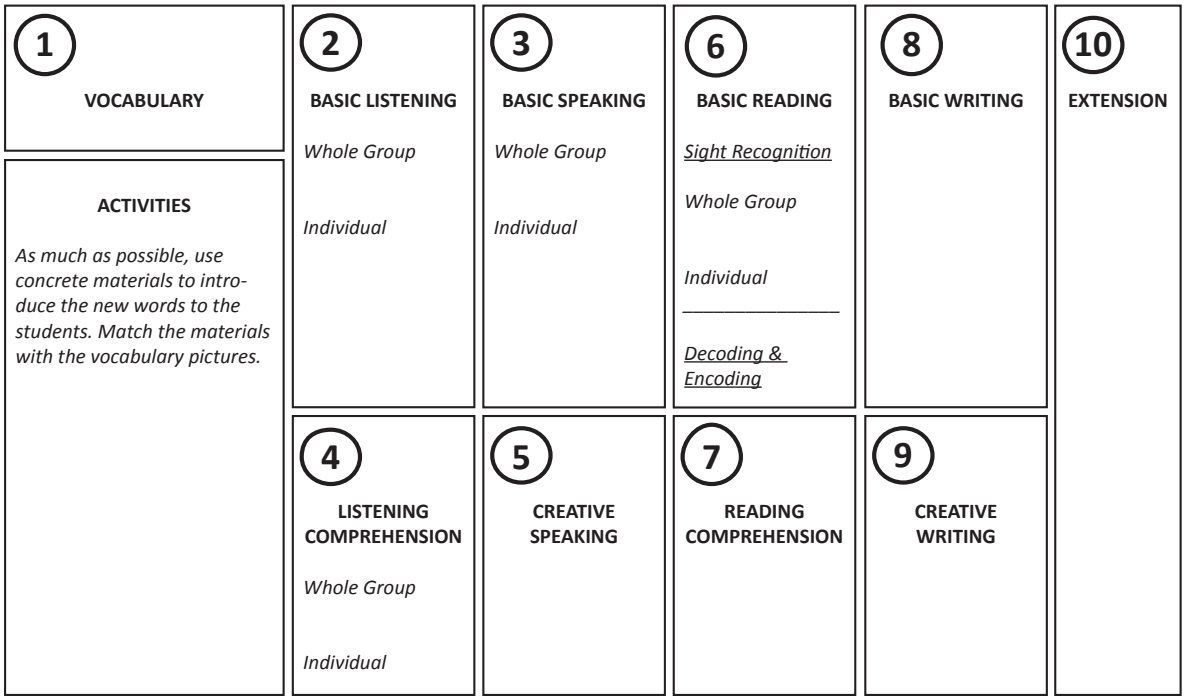
This program is designed to meet the academic realities faced by high school students every day, using a developmental process that integrates culture with skills development.

To this end, each key vocabulary word, in science, is viewed as a concept. The words are introduced concretely, using place-based information and contexts. Whenever possible, the concept is viewed through the Native heritage cultural perspectives. Using this approach, the students have the opportunity to acquire new information in manageable chunks, the sum total of which represent the body of information to be learned in the science program.

When the key vocabulary/concepts have been introduced, the students are then taken through a sequence of listening, speaking, reading, and writing activities designed to instill the vocabulary into their long-term memories.

This is the schema for the Developmental Language Process:

## The Developmental Language Process

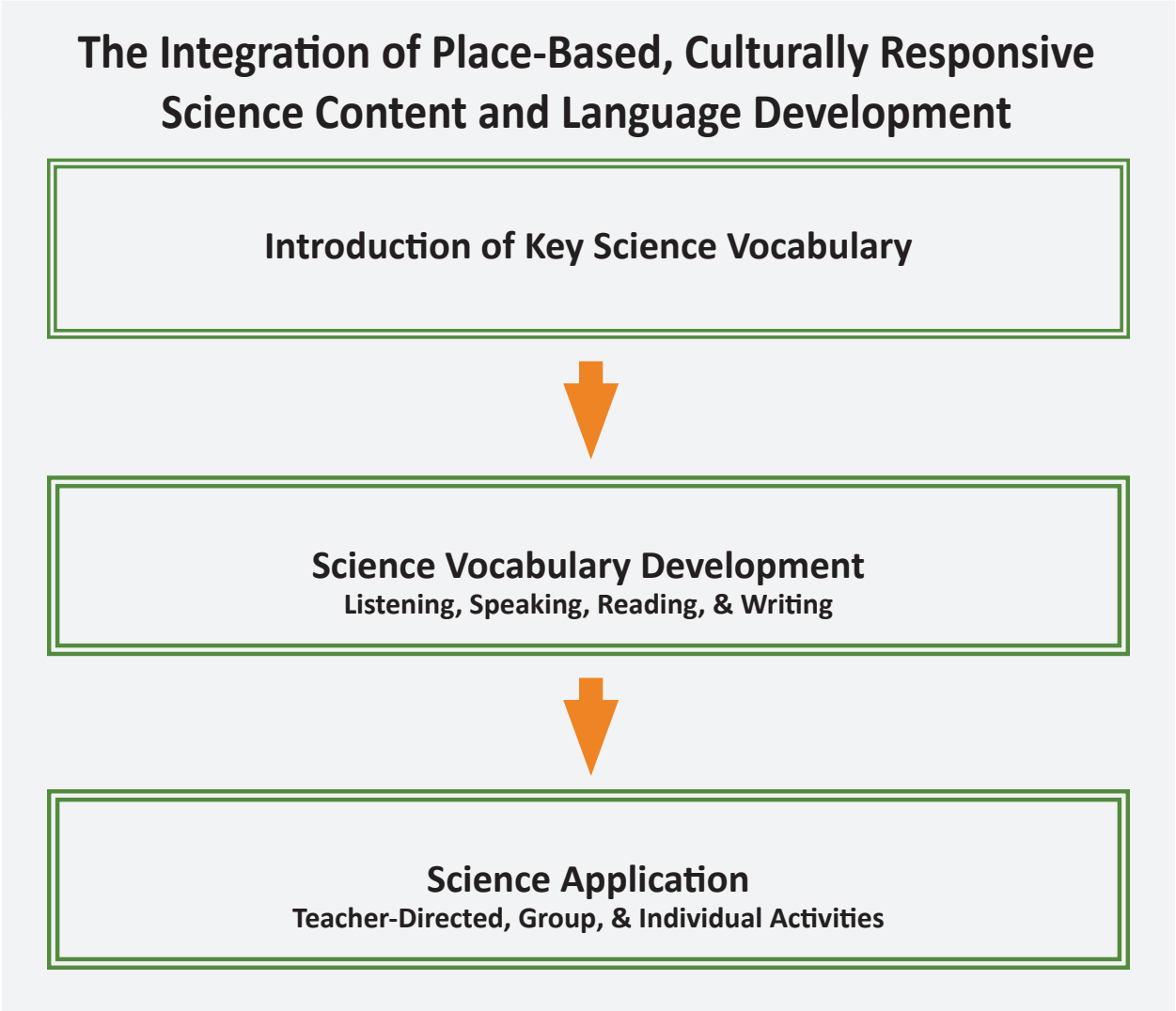


Finally, at the end of each unit, the students will participate in enrichment activities based on recognized and research-based best practices. By this time, the science information and vocabulary will be familiar, adding to the students' feelings of confidence and success. These activities will include place-based and heritage culture perspectives of the information learned.

This approach is radically different from current practices in most science classes. Historically, little or no formal vocabulary development takes place. It is assumed that the vocabulary is being internalized during the learning process, which is most often an erroneous assumption.

Increasing the language bases of the students will lead to improved comprehension in listening and reading, and higher levels of production in creative speaking and writing.

This, coupled with the place-based and culturally-responsive content, will provide the students with the foundations necessary for ongoing confidence and achievement.



# UNIT 1

## A–1: Science as Inquiry Process

# KEY VOCABULARY

# *Key Vocabulary*

| | |
|---|---|
| **EVALUATE** | *to determine the value or worth by careful study* |
| **COMMUNICATE** | *to share information, data, or findings with others through written or spoken words* |
| **MEASURE** | *to find the size, volume, mass, weight, or temperature of an object or how long and event occurs* |

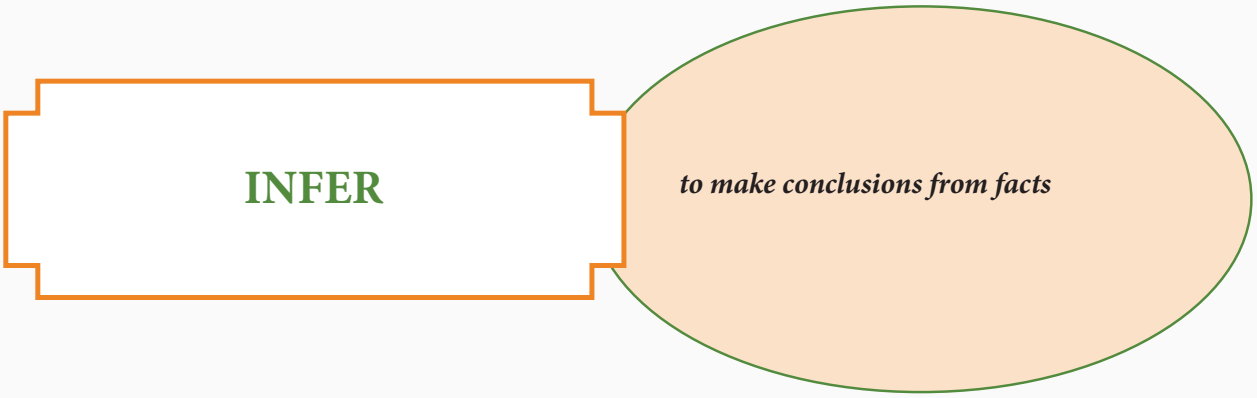
# *Key Vocabulary*

| | |
|---|---|
| **GENERALIZE** | *to draw a general conclusion from* |
| **CLASSIFY** | *to sort into groups according to their properties or patterns* |
| **PREDICT** | *to state possible results of an event or experiment based on past experiences or observations* |

# *Key Vocabulary*

| | |
|---|---|
| **IDENTIFY** | *to establish the identity of* |
| **DESCRIBE** | *to use words or pictures to show what is observed* |
| **OBSERVE** | *pay attention to behaviors or details and come to a conclusion* |

# *Key Vocabulary*



# LESSONS

# *Science Language for Success*

*Introduce the key science vocabulary, using concrete materials and/or pictures.*

## LISTENING

*Use the Mini Pictures activity page from the Student Support Materials. Have the students cut out the pictures. Say the key words and the students show the pictures.*


### Let's Move

Identify an appropriate body movement for each vocabulary word. This may involve movements of hands, arms, legs, etc. Practice the body movements with the students. When the students are able to perform the body movements well, say a vocabulary word. The students should respond with the appropriate body movement. You may wish to say the vocabulary words in a running story. When a vocabulary word is heard, the students should perform the appropriate body movement. Repeat, until the students have responded to each word a number of times.

### What's the Answer?

Before the activity begins, develop questions related to the concept being studied. For each question, prepare three answers—only one of which in each set is correct for the question asked. Ask the students the question and then read the three answers to them. The students should show you (using their fingers or prepared number cards) which answer is correct for the question asked. Repeat this process with other questions and answers.

## SPEAKING

### Right or Wrong?

Mount the vocabulary pictures on the board. Point to one of the pictures and say its vocabulary word. The students should repeat the vocabulary word for that picture. However, when you point to a picture and say an incorrect vocabulary word for it, the students should remain silent. Repeat this process until the students have responded a number of times to the different vocabulary pictures.

### Hand Tag

Group the students in a circle on the floor. Have the students place their hands on the floor, palms down. Stand in the center of the circle with the vocabulary picture and a flashlight. The object of the activity is to attempt to tag a student's hand or hands with the light of the flashlight. The students must pull their hands from the circle when they think they are about to be tagged. When you eventually tag a student's hand or hands, he/she must then say a complete sentence using the word for a vocabulary picture that you show. Repeat this process until many students have responded.

# *Science Language for Success*

## READING

*Introduce the science sight words to the students—match the sight words with the vocabulary pictures. The sight words are included in the Student Support Materials, attached to these lesson plans.*

*Note: After each unit, mount a set of the unit's words on the walls around the room. Use the "word walls" for review and reinforcement activities.*

### Sight Word Bingo

Before the activity begins, prepare a page that contains the sight words. Provide each student with a copy of the page. The students should cut out the sight words. When the students have cut out their sight words, each student should lay all of the sight words, but one, face down on his/her desk. Show a vocabulary picture. Any student or students who have the sight word for that picture face-up on their desks should show the sight word to you. Then, those sight words should be placed to the side and other sight words turned over in their place. Continue in this way until a student or students have no sight words left on their desks.

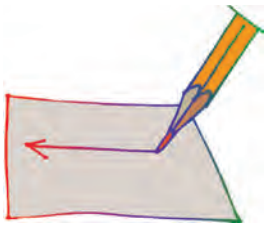
### Letter Encode

Give each student five copies of a page that contains the letters of the alphabet. The students should cut all of the letters out. Mount one of the science pictures on the board. The students must use the cut out letters to spell the word. Review the students' work. Repeat, until all of the words have been spelled in this way. The students should keep their letters in individual envelopes for use in other units.

### Student Support Materials

Have the students work on the activity pages from the Student Support Materials for this Unit.

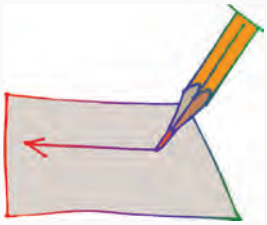
## WRITING



### Watch Your Half

Prepare a photocopy of each of the vocabulary pictures. Cut the photocopied pictures in half. Keep the picture halves in separate piles. Group the students into two teams. Give all of the picture halves from one pile to the players in Team One. Give the picture halves from the other pile to the players in Team Two. Say a vocabulary word. When you say "Go," the student from each team who has the picture half for the vocabulary word you said should rush to the board and write the word on the board. The first player to do this correctly wins the round. Repeat until all players have participated. This activity may be played more than once by collecting, mixing, and redistributing the picture halves to the two teams.

# WRITING (CONTINUED)



## Sentence Completion

Write a number of sentence halves on individual sentence strips. These should include both the beginning and ending halves of sentences. Mount the sentence halves on the board and number each one. Provide the students with writing paper and pencils/pens. Each student should then complete ONE of the sentence halves in his/her own words, writing his/her part of the sentence on the sheet of paper. When the students have completed their sentence halves, have a student read ONLY the sentence half he/she wrote. The other students must then attempt to identify the "other half" of the sentence on the board (by its number). Repeat until all of the students have shared their sentence halves in this way.

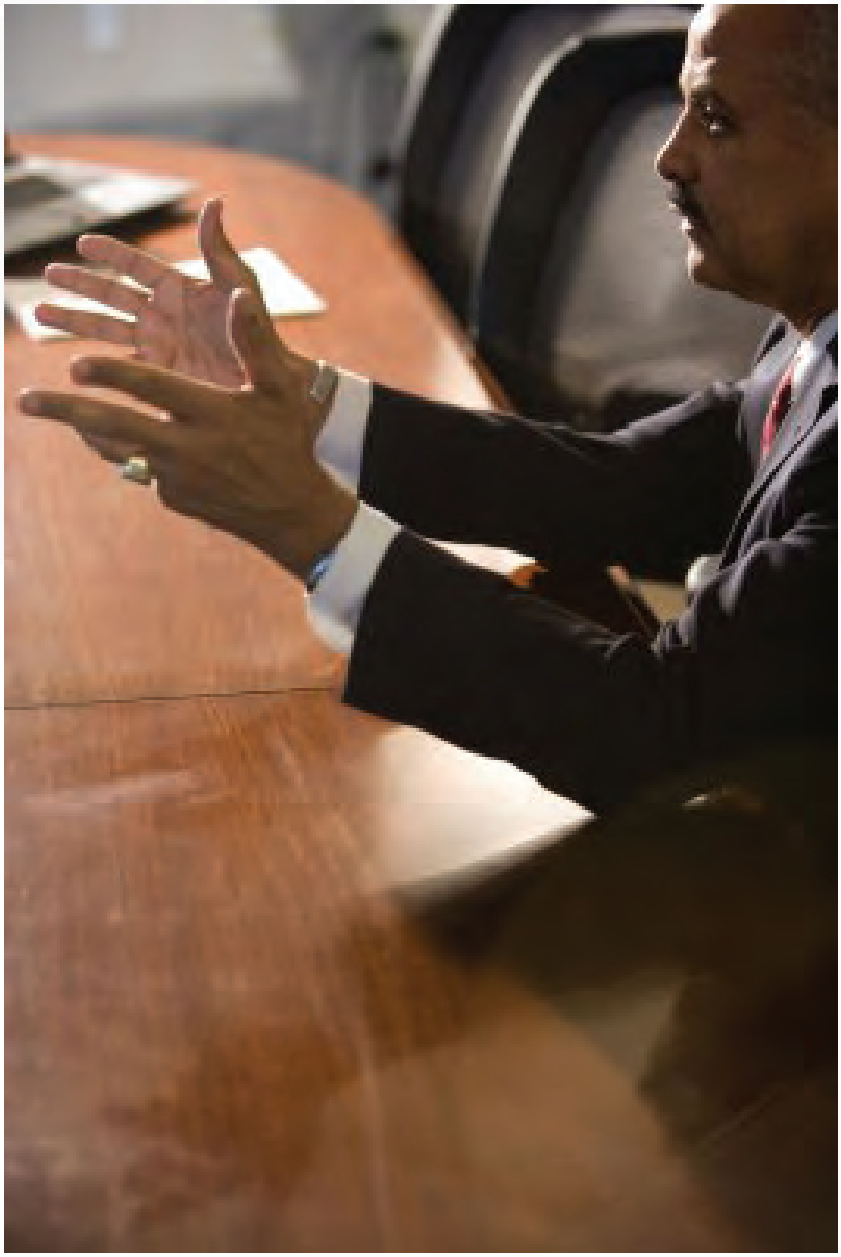
## Student Support Materials

Have the students work on the activity pages from the Student Support Materials for this Unit.

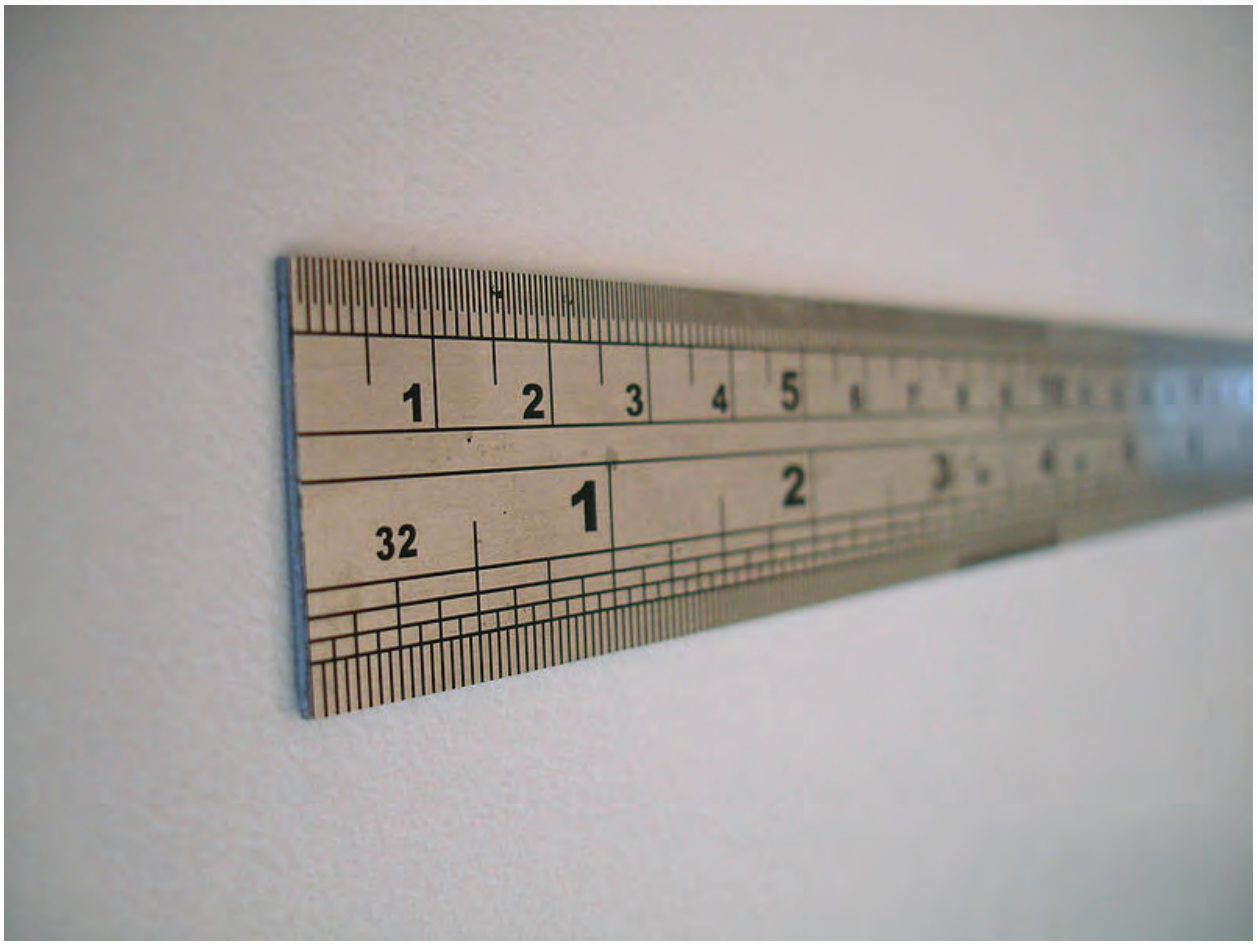
# VOCABULARY PICTURES

# PREDICT

# OBSERVE



# DESCRIBE


1
2
3
4
5
32
1
2

# MEASURE

# CLASSIFY

# GENERALIZE

# INFER

# COMMUNICATE

# EVALUATE

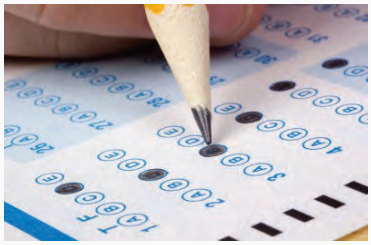
# IDENTIFY

# STUDENT SUPPORT MATERIALS

Listening • Mini Pictures

# *Listening: Mini Pictures*


*Have the students cut out the pictures. Say the key math words from this unit, and the students should hold up the pictures for them.*



# STUDENT SUPPORT MATERIALS

## Listening Comprehension

# Listening Comprehension


*Read the following sentences to the students. The students should circle "true" or "false" for each of the sentences. Review the students' work.*

1. To evaluate is to determine the value or worth of something by careful study. **True** **False**

2. Communicate is to share information, data, or findings with others through written or spoken words. **True** **False**

3. Measure is to find the size, volume, mass, weight, or temperature of an object. **True** **False**

4. Generalize is to sort into groups according to their properties. **True** **False**

5. Classify is to use words or pictures to show what is observed. **True** **False**

6. Predict is to state possible results of an event or experiment based on past experiences or observations. **True** **False**

7. Identify is to establish the identity of. **True** **False**

8. Describe is to pay attention to behaviors or details and come to a conclusion. **True** **False**

9. Observe is to draw a general conclusion from. **True** **False**

10. Infer is to make conclusions from facts. **True** **False**

# STUDENT SUPPORT MATERIALS

## Sight Words



evaluate

communicate

measure

generalize

classify

predict



identify

describe

observe

# infer

# STUDENT SUPPORT MATERIALS

Basic Reading • Sight Recognition

# Sight Words Activity Page

*Have the students highlight or circle the words in this word find. Words appear horizontally.*

| | | |
|---|---|---|
| classify<br>communicate<br>describe<br>evaluate | generalize<br>identify<br>infer | measure<br>observe<br>predict |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E | G | E | N | E | R | A | L | I | Z | E | A | B | S | C | T |
| T | O | R | C | L | A | P | C | B | V | T | Y | M | O | M | E |
| S | R | V | B | N | O | I | U | C | D | E | H | Q | I | A | O |
| D | S | T | Y | U | I | M | D | P | M | H | T | Y | G | Y | X |
| N | E | W | Q | Z | A | S | V | E | B | N | F | G | H | T | Y |
| P | R | C | O | C | O | M | M | U | N | I | C | A | T | E | B |
| R | V | J | H | B | G | T | N | R | S | T | Y | U | I | V | O |
| E | E | Q | B | S | V | D | C | S | B | O | I | I | L | A | U |
| D | E | R | B | S | C | X | A | P | K | N | R | F | Y | L | W |
| I | U | C | D | C | I | L | L | T | Z | T | U | I | Y | U | O |
| C | P | K | A | B | C | R | N | H | U | K | P | L | Z | A | A |
| T | E | B | N | G | T | Y | I | N | F | E | R | O | P | T | E |
| O | F | X | R | P | Q | S | N | R | E | C | B | D | U | E | M |
| M | C | L | P | Y | D | S | Q | O | A | O | R | E | Q | L | B |
| R | S | X | W | M | E | A | S | U | R | E | D | N | Z | V | R |
| D | E | S | C | R | I | B | E | E | H | M | P | W | I | Q | B |

# Sight Words Activity Page

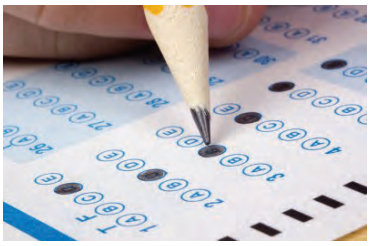
*Have the students highlight or circle the words in this word find. Words appear horizontally.*

| | | |
|---|---|---|
| classify<br>communicate<br>describe<br>evaluate | generalize<br>identify<br>infer | measure<br>observe<br>predict |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | G | E | N | E | R | A | L | I | Z | E | | | | | |
| | O | | | | | | | | | | | | | | |
| | R | | | | | I | | | | | | | | | |
| | S | | | | | | D | | | | | Y | | | |
| | E | | | | | | | E | | | F | | | | |
| P | R | | | C | O | M | M | U | N | I | C | A | T | E | |
| R | V | | | | | | | | S | T | | | | V | |
| E | E | | | | | | | S | | | I | | | A | |
| D | | | | | | | A | | | | | F | | L | |
| I | | | | | | L | | | | | | | Y | U | |
| C | | | | | C | | | | | | | | | A | |
| T | | | | | | | I | N | F | E | R | | | T | |
| | | | | | | | | | | | | | | E | |
| | | | | | | | | | | | | | | | |
| | | | | M | E | A | S | U | R | E | | | | | |
| D | E | S | C | R | I | B | E | | | | | | | | |

# Sight Words Activity Page

*Have the students cut out the key words and glue them at the bottom of their pictures.*



communicate observe describe classify

communicate observe describe classify

predict generalize

# *Sight Words Activity Page*

# *Sight Words Activity Page*

*Have the students print the key words from this unit horizonally in the boxes (each word may be written more than once). They should then fill in all other boxes with any letters. Have the students exchange pages. The students should then circle the words on the page.*

# STUDENT SUPPORT MATERIALS

**Basic Reading • Encoding**

# *Encoding Activity Page*

*Have the students cut out and encode the syllables of the words, OR number the syllables in their correct sequence.*

| ti | i | den | fy |
|---|---|---|---|
| _____ | _____ | _____ | _____ |

| sure | mea |
|---|---|
| _____ | _____ |

| pre | dict |
|---|---|
| _____ | _____ |

# *Encoding Activity Page*

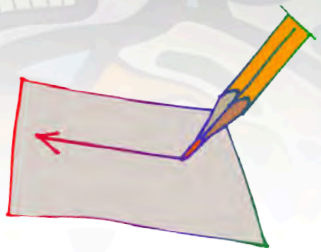
*Have the students cut out and encode the syllables of the words, OR number the syllables in their correct sequence.*

| ate | e | val | u |
|---|---|---|---|
| _____ | _____ | _____ | _____ |

| ob | serve |
|---|---|
| _____ | _____ |

| fer | in |
|---|---|
| _____ | _____ |

# Word Scramble Activity Page



*Rearrange or unscramble the following letters to form one of the listed unit words. As you use a word, cross it off.*

| | | | | |
|---|---|---|---|---|
| classify | predict | communicate | infer | identify |
| describe | measure | observe | evaluate | generalize |

**r t p d e c i** _ _ e _ _ c _

**r b v o s e e** _ b _ e _ _ _

**d e s b c i r e** _ e _ _ _ _ _ e

**s m r a u e e** m _ _ s _ _ _

**a l s f c i s y** _ l _ s _ _ _ _

**e e n r g z e l i a** _ _ _ _ _ a l _ z _

**e n f i r** _ _ _ e _

**u i c m e t a m n c o** _ o _ _ _ n i _ _ _ _

**n e d y i t f i** _ _ e _ t _ _ _

**l v a u e e t a** e _ a _ _ _ _ _

# STUDENT SUPPORT MATERIALS

## Reading Comprehension

# Reading Comprehension Activity Page

*Have the students cut out the words and glue them under their definitions.*

| | | |
|---|---|---|
| to determine the value or worth by careful study | to determine the value or worth by careful study | to tell how something looks, feels, tastes, and so on |
| to draw a general conclusion from | to sort into groups according to their properties or patterns | to state possible results of an event or experiment based on past experiences or observations |
| to establish the identity of | to use words or pictures to show what is observed | pay attention to behaviors or details and come to a conclusion |
| to make conclusions from facts | | |

communicate observe describe classify

communicate observe describe classify

predict generalize

# Reading Comprehension Activity Page

*Write the word or words that best complete each sentence in the space below. Words may be used only once.*

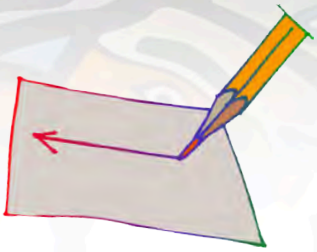
| | | | | |
|---|---|---|---|---|
| classify | predict | communicate | infer | identify |
| describe | measure | observe | evaluate | generalize |

1. Sudents take yearly assessments to _____ their skills in reading, writing, and math.
2. Were the tourists able to _____ the humpback whale breaching off the starboard of the ferry.
3. The students in Life Science will learn how scientists _____ animals.
4. My mother, the "local weather reporter" _____ rain for the week end.
5. She tends to _____, instead of stating the specifics.
6. It will be difficult to _____ how the new dress code will effect student attitude.
7. We _____ a lot of information through our body language.
8. The ounce is a _____ of weight.
9. The police officer asked the witness to _____ the robber.
10. Many young readers can _____ with the main character of the story.

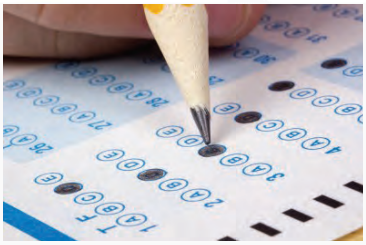
# STUDENT SUPPORT MATERIALS

## Basic Writing

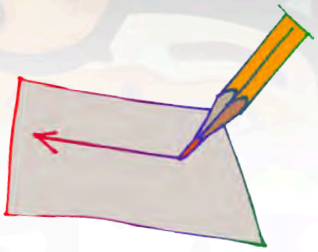
# Basic Writing Activity Page



*Have the students write the word for each picture.*



# *Basic Writing Activity Page*



*Have the students write in the missing letters.*

**cla_____y**

**co_____icate**

**de_____be**

**e_____uate**

**ge_____alize**

**iden_____y**

**in_____**

**m_____ure**

**obs_____e**

**p_____ict**

# Graphic Organizer

*Model the process for students using the following unit words.*

| WHAT IT IS: | | WHAT IT IS NOT: |
|---|---|---|
| EXAMPLES: | classify | NOT EXAMPLES: |

| WHAT IT IS: | | WHAT IT IS NOT: |
|---|---|---|
| EXAMPLES: | communicate | NOT EXAMPLES: |

| WHAT IT IS: | | WHAT IT IS NOT: |
|---|---|---|
| EXAMPLES: | describe | NOT EXAMPLES: |

| WHAT IT IS: | | WHAT IT IS NOT: |
|---|---|---|
| EXAMPLES: | evaluate | NOT EXAMPLES: |

| WHAT IT IS: | | WHAT IT IS NOT: |
|---|---|---|
| EXAMPLES: | generalize | NOT EXAMPLES: |

# Graphic Organizer

| WHAT IT IS: | | WHAT IT IS NOT: |
|---|---|---|
| EXAMPLES: | identify | NOT EXAMPLES: |

| WHAT IT IS: | | WHAT IT IS NOT: |
|---|---|---|
| EXAMPLES: | infer | NOT EXAMPLES: |

| WHAT IT IS: | | WHAT IT IS NOT: |
|---|---|---|
| EXAMPLES: | measure | NOT EXAMPLES: |

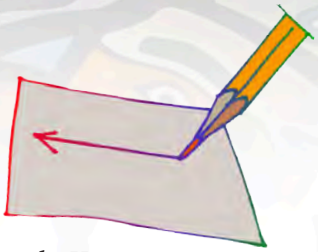
| WHAT IT IS: | | WHAT IT IS NOT: |
|---|---|---|
| EXAMPLES: | observe | NOT EXAMPLES: |

| WHAT IT IS: | | WHAT IT IS NOT: |
|---|---|---|
| EXAMPLES: | predict | NOT EXAMPLES: |

# STUDENT SUPPORT MATERIALS

## Creative Writing

# *Creative Writing Activity Page*



*Have the students write sentences of their own, using the key words from this unit. When the students' sentences are finished, have them take turns reading their sentences orally. The students should say "Blank" for the key words; the other students must name the "missing" words. You may wish to have the students write the "definitions" for the key words.*

**CLASSIFY**

_____

**COMMUNICATE**

_____

**DESCRIBE**

_____

**EVALUATE**

_____

**GENERALIZE**

_____

**INFER**

_____

**IDENTIFY**

_____

**MEASURE**

_____

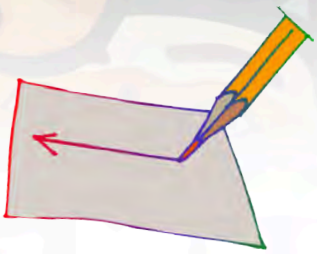
**OBSERVE**

_____

**PREDICT**

_____

# Creative Writing Activity Page



*On the lines below, write a paragraph based on the picture. Before you begin writing, reflect on the unit words – describe, generalize, infer, observe, and predict*

# UNIT ASSESSMENT

## A–1: Science as Inquiry Process

# SCIENCE PROGRAM

**Unit Assessment Teacher's Notes**
**Grade 7 • Unit 1 (A–1)**
**Theme: Science as Inquiry Process**

**Date:_____**

# *Unit Assessment*

*Provide each student with a copy of the students' pages. Read the following instructions aloud. The students should answer the questions on their copies of the assessment.*

## BASIC LISTENING

Turn to pages 1 in your test. Look at the pictures in the boxes.

1. Write the number 1 on top of the picture for **PREDICT**.
2. Write the number 2 on top of the picture for **OBSERVE**.
3. Write the number 3 on top of the picture for **DESCRIBE**.
4. Write the number 4 on top of the picture for **CLASSIFY**.
5. Write the number 5 on top of the picture for **GENERALIZE**.
6. Write the number 6 on top of the picture for **INFER**.
7. Write the number 7 on top of the picture for **COMMUNICATE**.
8. Write the number 8 on top of the picture for **EVALUATE**.
9. Write the number 7 on top of the picture for **IDENTIFY**.
10. Write the number 8 on top of the picture for **MEASURE**.

## LISTENING COMPREHENSION

Turn to page 2 in your test. Listen to the sentences I say. Circle "T" for true and "F" for false sentences."

1. To evaluate is to determine the value or worth of something by careful study.
2. Communicate is to share information, data, or findings with others through written or spoken words.
3. Measure is to find the size, volume, mass, weight, or temperature of an object.
4. Generalize is to sort into groups according to their properties.
5. Classify is to use words or pictures to show what is observed.
6. Predict is to state possible results of an event or experiment based on past experiences or observations.

# *Unit Assessment*

7. Identify is to establish the identity of.
8. Describe is to pay attention to behaviors or details and come to a conclusion.
9. Observe is to draw a general conclusion from.
10. Infer is to make conclusions from facts.

## SIGHT RECOGNITION

Turn to pages 3 and 4 in your test. Look at the pictures in the boxes. Circle the word for each picture.

## DECODING/ENCODING

Turn to page 5 in your test. Look at the scrambled letters on the left. Rearrange or unscramble the letters to form each of the unit words.

## READING COMPREHENSION

Turn to page 6 in your test. Write the word or words that best complete each sentence in the space below. Words may be used only once.

## BASIC WRITING

Turn to page 7 in your test. Look at the pictures in the boxes. Write the word for each picture.

## CREATIVE WRITING

Turn to page 8 in your test. Write a sentence of your own, using each word.

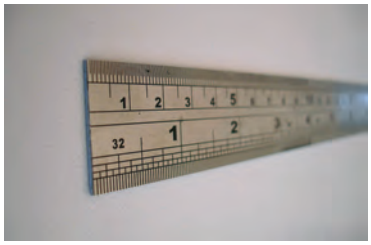
*Teacher: To get a percentage for this student's assessment, divide the total number of questions correct by the total number of questions, then multiply this answer by 100 to determine the percentage of questions answered correctly.*

# SCIENCE PROGRAM

**Unit Assessment Student Pages**
**Grade 7 • Unit 1 (A–1)**
**Theme: Science as Inquiry Process**

**Date:_____ Student's Name:_____**

**Number Correct:_____ Percent Correct:_____**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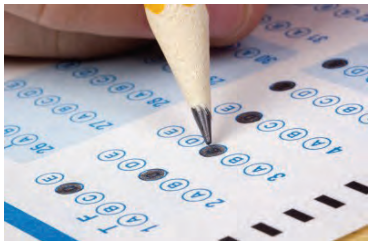

1. T F

2. T F

3. T F

4. T F

5. T F

6. T F

7. T F

8. T F

9. T F

10. T F

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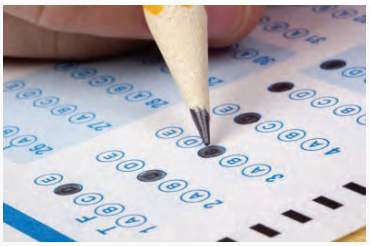
communicate
describe
evaluate
generalize
identify
infer
measure
observe
predict



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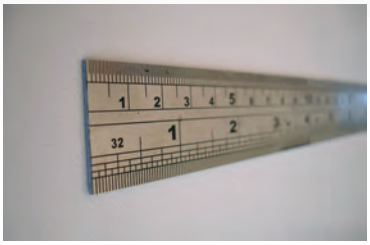

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| | | | | |
|---|---|---|---|---|
| classify | predict | communicate | infer | identify |
| describe | measure | observe | evaluate | generalize |

1. Sudents take yearly assessments to _____ their skills in reading, writing, and math.

2. Were the tourists able to _____ the humpback whale breaching off the starboard of the ferry.

3. The students in Life Science will learn how scientists _____ animals.

4. My mother, the "local weather reporter" _____ rain for the week end.

5. She tends to _____, instead of stating the specifics.

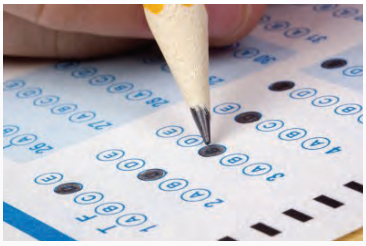
6. It will be difficult to _____ how the new dress code will effect student attitude.

7. We _____ a lot of information through our body language.

8. The ounce is a _____ of weight.

9. The police officer asked the witness to _____ the robber.

10. Many young readers can _____ with the main character of the story.



**CLASSIFY**

_____

**COMMUNICATE**

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**DESCRIBE**

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**EVALUATE**

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**GENERALIZE**

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**INFER**

_____

**IDENTIFY**

_____

**MEASURE**

_____

**OBSERVE**

_____

**PREDICT**

_____